

## ABSTRACT OF THE DISCLOSURE

The present invention relates to a method and a system of a high code speed low error probability underwater acoustic coherent communication for underwater transferring instruction, data and image. The communication system includes a host machine installed on a mother ship or a main control underwater vehicles A and a guest machine installed on an underwater vehicle B, wherein the host machine comprises an electronic subassembly, a transducer and a receiving line array which is vertically deployed and consists of more than two hydrophones, and the guest machine comprises an electronic subassembly and a transmitting/receiving transducer. The signal processing method of the present invention is based on the joint technology of the space diversity, the self-optimized adaptive decision feedback equalizer and self-optimized adaptive phase tracker so as to overcome the affection of motion of the channel and the vehicles, such that the received signal could be quite close to the transmitted signal, and the bit error probability is low.